

Geotechnical Investigation



Cadence - Phases 2 and 3

Ellsworth Road and Guadalupe Road
Mesa, Arizona
ProTeX Job No.: 8144



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August 21, 2018

PPGN-Crismon, LLLP
c/o Silver Fern Companies
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Phoenix, AZ

Re: **Geotechnical Investigation**

Project: Cadence - Phases 2 and 3
Ellsworth Road and Guadalupe Road
Mesa, Arizona

ProTeX Job No.: 8144

Attention: Ms. Alegria

At your request, ProTeX has completed a soil investigation for the proposed residential development. The accompanying report includes field observations and laboratory testing supporting our conclusions and recommendations for the proposed development.

Respectfully submitted,
ProTeX - the PT Xperts, LLC



Date Expires: 3/31/2021
Thomas M. Perkins, P.E.



Date Expires: 3/31/2019
Delbert A. Rapier, M.S.E., P.E.



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APPENDICES

Appendix A – Laboratory Test Results

Hydro-Collapse Tests/In-Situ Moisture and Densities
Grain Size Distribution, Atterberg Limits and Expansion Tests
Chloride, Sulfate

Appendix B – Site Information

Site Plan

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Boring Logs

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Legend

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Executive Summary

ProTeX was contracted by PPGN-Crismon, LLLP to provide general information with respect to the engineering characteristics of onsite soils and provide recommendations for foundations and pad preparation for the site referred to as the Cadence - Phases 2 and 3 located at Ellsworth Road and Guadalupe Road in Mesa, Arizona.

This firm understands the proposed development will consist of one or two story single family residential structures imposing relatively light to moderate foundation loads.

Field investigation and laboratory testing indicated that the site consists mainly of non-plastic to medium plasticity silty sand, silty clayey sand, clayey sand, clayey gravel, sandy silty clay and sandy clay soils. The expansion potential for site soils when foundation bearing soils are exposed to a moisture increase is anticipated to be very low to low for the surface level soils. All lots are subject to expansive soils and post-tensioned slab/foundation systems are recommended.

Settlements at the site are anticipated to be within accepted tolerances provided that pad preparation is performed as specified and no significant changes in moisture content of foundation/floor slab bearing soils occur and proper drainage and irrigation control are maintained. Drainage should be directed away from the structure and off the lot during and after construction and should be maintained for the life of the project. In no case should long-term ponding be allowed near structures. Proper design and placement of yard vegetation and irrigation systems should be used so that structural foundation slab bearing soils are not exposed to moisture content fluctuations.

The site is located within an area of regional groundwater withdrawal; however, based on the Earth fissure Maps provided by the Arizona Geological Survey there is no indication of earth fissures on site or within approximately 3 miles of the site.

Based on the findings of the soils investigation, the site is considered suitable to construct single family residential structures imposing relatively light to moderate foundation loads provided floor and foundation systems are properly designed, soils properly conditioned as specified and proper maintenance of drainage and irrigation systems. All parties should be aware that the site soils are clayey and have a potential for expansion. Fluctuation in moisture content of foundation bearing soils may result in slight movements that may result in cosmetic distress.



1.0 INTRODUCTION

1.1 Scope

ProTeX was retained by PPGN-Crismon, LLLP to evaluate the surface and subsurface soil conditions. The content of this report contains the findings from the field exploration and laboratory testing, with supporting recommendations for the proposed development.

1.2 Proposed Site Development

It is this firm's understanding the proposed development will consist of one or two story single family residential structures of masonry, wood and/or steel frame construction imposing relatively light to moderate foundation loads.

1.3 Terms and Conditions

This report was prepared for PPGN-Crismon, LLLP. The contents of this report may not be relied upon by any other party without the expressed written permission of ProTeX - the PT Xperts, LLC and the written permission of PPGN-Crismon, LLLP. The report presents site conditions at the time of the investigation and for the aforementioned proposed development. The report should be updated prior to construction if a maximum of one year has elapsed from the issued date.

2.0 FIELD AND LABORATORY TESTING

2.1 Geotechnical Site Reconnaissance

The site consists of approximately 161 acres of currently undeveloped land. At the time of the field site visit on July 27, 2018 the following site conditions were observed:

- Native desert landscape with light cover of small trees, bushes and weeds
- Small wash traversed from east to west in the northern portion of the site
- Dirt lined canal located near the south east portion of the site
- End dump stockpiles in the south east corner of the site near the canal
- General slope and drainage of the site trends toward the south



2.2 Field Investigation

A total of 34 test holes were completed at the site for the purpose of evaluating subsurface conditions. All of test holes terminated at a nominal depth of 15 feet. In addition, 12 test holes were completed, in the proposed roadways, to determine soil properties for pavement design. At each test hole location, the soils encountered were visually observed, classified, logged and representative samples were obtained where applicable. Refer to the site plan in Appendix B for approximate test hole locations.

2.3 Laboratory Testing

Subsequent to the field investigation, soil samples were submitted for laboratory testing. Tests were performed to determine the following:

- **Hydro-collapse-** Used to evaluate undisturbed lateral ring confined (obtained from a split-barrel California-type Sampler) one-dimensional vertical soil movement under load (1500 and 3000 psf) to water inundation/saturation in general accordance with the American Society for Testing and Materials (ASTM) Test Method D4546.
- **Sieve Analysis and Atterberg Limits-** Used for formal classification of soils in general accordance with the Unified Soil Classification System (USCS) per ASTM Test Method D2487. Sieve analysis is performed in general accordance with ASTM Test Methods D421, D422 and D-1140. The Atterberg Limits were determined in general accordance with ASTM Test Method D-4318.
- **Expansion Index-** To determine the potential expansion of remolded soils based on the Expansion Index Test Method (ASTM D4829).
- **Sulfates and Chlorides-** To determine levels of water soluble sulfate (ARIZ 733) and chloride (ARIZ 736) content, which could negatively impact project steel/concrete.

Expansion Index- Expansive Potential Categorization	
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
>130	Very High



Laboratory Test Summary

Location	Depth	PI	% Passing #200	% < 0.002mm	USCS Soil Class	Expansion Index
B1	0-3'	10	79	25.6	CL	29
B1	5-7'	18	60.7	23.3	CL	30
B2	0-3'	9	77.1		CL	
B2	7-9'	13	64.4		CL	
B3	0-3'	8	58.6		CL	
B4	0-3'	8	54		CL	
B4	4-6'	12	65.7		CL	
B5	0-3'	11	54.2		CL	
B6	0-3'	7	76		CL-ML	
B6	8-10'	17	77.1		CL	
B7	0-3'	10	54.4		CL	
B8	0-3'	11	64.7		CL	
B8	5-7'	9	66.4		CL	
B9	0-3'	9	48.5		SC	
B9	5-7'	14	43.3		SC	
B10	0-3'	13	31.4		GC	
B11	0-3'	10	59.7		CL	
B11	5-7'	18	71.7		CL	
B12	0-3'	NP	38.6		SM	
B13	0-3'	9	51.8		CL	
B13	6-8'	10	60.8		CL	
B14	0-3'	6	55.3		CL-ML	
B14	10-12'	8	46.2		SC	
B15	0-3'	15	59.3		CL	
B16	0-3'	10	57.5		CL	
B16	4-6'	16	74.4		CL	
B17	0-3'	5	39.2		SC-SM	
B18	0-3'	8	47.2		SC	
B18	6-8'	20	69.3		CL	
B19	0-3'	7	66	20.8	CL-ML	31
B20	0-3'	14	70.1		CL	
B20	5-7'	18	78.7		CL	
B21	0-3'	10	68.5		CL	
B22	0-3'	8	71.1		CL	
B22	7-9'	7	55.8		CL-ML	
B23	0-3'	NP	15.5		SM	
B24	0-3'	8	61.3		CL	
B24	6-8'	13	68.4	21.8	CL	26
B25	0-3'	10	52.5		CL	
B26	0-3'	10	70.8		CL	
B26	6-8'	10	70.8	22.4	CL	26
B27	0-3'	10	62.9		CL	
B28	6-8'	7	75.7		CL-ML	
B28	0-3'	8	72.5		CL	
B29	0-3'	11	80.2		CL	
B30	0-3'	8	73.2		CL	



Location	Depth	PI	% Passing #200	% < 0.002mm	USCS Soil Class	Expansion Index
B30	8-10'	12	78.9		CL	
B31	0-3'	6	72.4		CL-ML	
B33	0-3'	5	40.3		SC-SM	
B34	0-3'	8	70		CL	
B34	5-7'	4	52.3		CL-ML	12
BC1	0-3'	10	78.5		CL	
BC2	0-3'	7	64.4		CL-ML	
BC3	0-3'	9	53.9		CL	
BC4	0-3'	NP	36.1		SM	
BC5	0-3'	9	69.5		CL	
BC6	0-3'	14	85.3		CL	
BC7	0-3'	7	46.8		SC-SM	
BC8	0-3'	9	49.3		SC	
BC9	0-3'	8	66		CL	
BC10	0-3'	12	71.9		CL	
BC11	0-3'	10	80		CL	
BC12	0-3'	10	64		CL	

See Appendix A for a detailed compilation of the laboratory test results.

3.0 GENERAL SITE CONDITIONS

3.1 Soil Stratigraphy

Based on the field exploration and laboratory testing the subsurface profile, to the depths explored, consist primarily of silty sand, silty clayey sand, clayey sand, clayey gravel, sandy silty clay and sandy clay of non-plastic to medium plasticity extending to depths explored. Refer to the boring logs in Appendix C for a detailed description of the subsurface soil profile.

3.2 Potential for Soil Hydro-Collapse (Settlement Potential)

Laboratory tests and Blow Counts (N-values) indicate the subsurface soils have a low potential for hydro-collapse at the anticipated foundation load of 1500psf (See the attached laboratory test results and boring logs). The potential for hydro-consolidation of the subsurface soils can be mitigated. Foundation bearing soils should be over-excavated and re-compacted. (See Section 5.0 – Site Preparation).



3.3 Potential for Soil Expansion (Expansion Potential)

The expansion potential of the native soils, to the depths explored based on ASTM test method D4829, is considered very low to low. Soils selected for testing for expansion potential were those that represented clayey soils with varying plasticity index values to determine the range of expansive potential soils across the site. The Expansion Index values typically tend to be higher with higher plasticity indices as can be seen in the test data for the site. The soils that tested non-plastic are comprised of silts and sands and are considered to have a very low potential for expansion and thus were not tested.

3.4 Potential for Corrosion

Soils were tested for water soluble sulfates and chlorides. The International Building Code specifies limits for soluble sulfate levels of 1000ppm. The soils tested yielded results below these levels and do not require any specialized design requirements. The test results are presented in Appendix A.

3.5 Excavation and Workability

Based on the soil borings, it is anticipated that conventional excavation equipment may be utilized to depths of 15 feet. However, this generalized assessment is not intended to be the sole basis for contractors preparing earthwork bids. Undiscovered shallow bedrock, cemented soils, cobbles, boulders, and weathered/broken bedrock may make excavation more difficult than expected. In addition, the relative ease/efficiency of excavation is heavily dependent on operator skill and the type of equipment assigned to the project. Thus, prospective earthwork contractors bidding on this project need to assess site excavation conditions for themselves. Trench shoring, benching, or laying back of excavations greater than 3 feet in depth may be required to satisfy government safety regulations for personnel safety.

3.6 Earth Fissure Review

The site is located within an area of regional groundwater withdrawal. Arizona Geological Survey has been commissioned to study earth fissures associated with the groundwater withdrawal. The Earth Fissure Maps provided by the Arizona Geological Survey indicate no known earth fissures on site or within approximately 3 miles of the site.



3.7 Seismic Characteristics

The subject site is located in an area of low seismic activity. Values have been developed based on knowledge of the local geological conditions, soils encountered during the site investigation of the subsurface soils, and the 2012/15 International Building Code (IBC). Based on knowledge of the geology of the area a 100 feet boring was not advanced.

Site Class	D (Stiff Soil Profile)
Central Latitude	33.309018°N
Central Longitude	111.618504°W
S _s Spectral Acceleration for Short Period	0.201g
S ₁ Spectral Acceleration for a 1-Second period	0.063g
F _a Site Coefficient for Short Period	1.60
F _v Site Coefficient for a 1-second Period	2.40

3.8 Liquefaction Potential

The soil encountered during the site investigation consisted of silty sand, silty clayey sand, clayey sand, clayey gravel, sandy silty clay and sandy clay. Based on the soil types and the low ground motion hazard (relatively low ground acceleration), the potential for liquefaction of the site soils is considered to negligible.

3.9 Shrinkage

Field and laboratory tests such as blow counts (N-values), in-situ densities, and hydro-collapse testing indicates that during grading, soils will likely be compacted to densities greater than the current density of the native soils. Both site specific testing and experience indicates that there is variability of the site soils subsurface and thus shrinkage across the site will vary such that uniform shrinkage across this site during earthwork operations is unlikely. The shrinkage values provided are based on standard construction techniques and may vary depending on the equipment used and the manner in which the grading is performed.

Depth (ft)	Estimated Shrinkage (%)
0-3	15-20



4.0 RECOMMENDATIONS

The recommendations contained herein are based on the findings of the field investigation, laboratory test results and local experience.

4.1 Foundations

It is highly recommended that the design of foundations be done under the direction of a registered professional engineer with structural expertise. Post-tension slab-on-grade foundations may be utilized in the design of light to moderately loaded single family residential structures. Conventional foundations can be utilized for isolated patio footings, site walls or in conjunction with post-tensioned slabs. It is recommended that foundation excavations be inspected prior to placement of concrete to ensure they are free of debris and loose soils. Laboratory testing indicates that the expansion potential of the site soils varies between vary low to low; Thus, it is recommended that a post-grading soils report be performed following site grading activities to determine the final foundation design.

4.1.1 Conventional Foundation System for Patios and Site Walls

Shallow foundations systems should bear a minimum of 1.5 feet below lowest adjacent grade extending laterally within 5 lateral feet from the edge of foundation. Due to the properties of the native soils as indicated by laboratory testing, it is recommended that foundations bear on native undisturbed soils or controlled compacted fill. Controlled compacted fill may consist of on-site and/or imported material that is placed or areas that are scarified, moisture processed and re-compacted. The following table provides allowable bearing capacities for the site.

Allowable Bearing Capacity for Shallow Depth Conventional Foundation Systems for Patios and Site Walls:

*Footing Depth (ft.)	Bearing Stratum	Allowable Soil Bearing Capacity
1.5	Firm Undisturbed Native soils or Controlled Compacted Fill	1500 psf

**Depth to base of perimeter footings is measured from the lowest adjacent finished grade elevation within 5 feet of edge of footing. Depth to base of interior footings measured from top of floor slab.*

Foundation widths should meet building code minimums and should not be larger than 7 feet and 4 feet, for spread and continuous foundations, respectively.



The recommended foundation bearing pressures should be considered allowable maximums for dead plus design live loads and may be increased by one-third when considering total loads including transient wind or seismic forces. The weight of the foundation concrete below grade may be neglected in dead load computations.

Foundation excavations should be inspected to verify that they are free of loose soil that may have blown or sloughed into the excavations and ensure that the footings will bear upon firm native undisturbed soils or engineered fill.

The stem walls should be well reinforced to distribute stresses caused by possible non-uniform bearing capacity and/or minor differential foundation movements. It is recommended that stem walls and footings be reinforced. The structural engineer should design the footings and stems for the site soil conditions.

Preparation of the site to raise or lower the building pad should be done in accordance to the Section 5 - Site Preparation.

4.1.2 Post-tension Slab-on-Grade Foundation System

For the purpose of the post-tension slab design an allowable bearing capacity of 1250psf is assigned. The post-tensioned foundation system should bear on a minimum of 1.0 feet of controlled compacted fill. The following design parameters are assigned for use in the structural design of the foundation systems.

Soil Subgrade Modulus (Ks)(for compacted fill):

Edge Moisture Variation (Em):

Edge Lift Condition: 5.0 feet

Center Lift Condition: 9.0 feet

Maximum Differential Soil Movement (Ym):

Edge Lift Condition: 0.5 inches

Center Lift Condition 0.3 inches



4.2 Exterior Slab-on-Grade

Exterior slabs on grade should bear directly on grade and contain a minimum of 5.0 sacks of Portland cement per cubic yard with a minimum thickness of 5 inches. A minimum of 6 inches of subgrade should be scarified moisture processed and compacted to the specifications in the earthwork section of this report.

4.3 Lateral Loadings

The design of retaining walls for the site should be designed to retain the lateral loads applied by the site soils. The following values are provided in Equivalent Fluid Pressures for unrestrained, restrained and passive resistance.

Lateral Equivalent Fluid Pressures for Backfill:

*Unrestrained Walls	35 pcf
*Restrained Walls	50 pcf
Passive Resistance	373 pcf
Coefficient of Base Friction:	0.50

**The backfill pressures stated do not include temporary forces imposed during compaction of the backfill, swelling pressures developed by over-compacted clayey backfill soils, hydrostatic pressures from inundation of backfills, and/or surcharge loads. Walls should be suitably braced during backfilling to prevent damage and deflection.*

Design of below grade structures should account for or prevent potential hydrostatic buildup. In addition, any below grade structure penetrations to facilitate drainage may allow piping of soil and water if not addressed properly in the design of the structure.

4.4 Drainage

Establishment and long term maintenance of proper lot post-construction surface drainage is critical.

Because of the potential for an adverse effect on structures, it is highly recommended that moisture infiltration and fluctuation of bearing soils for structural foundation/floor be minimized. Roof runoff should be collected and discharged away from the house structures. Drainage of surface water away from the



structures should be provided during construction and maintained by the homeowner throughout the life of the structure. In no case should long-term ponding be allowed near house structures. IRC



Section R401.3 specifically requires “The grade away from the foundation walls shall fall a minimum of 6 inches within the first 10 feet. Where lot lines, walls, slopes or other physical barriers prohibit 6 inches of fall within 10 feet, drains or swales shall be provided to ensure drainage away from the house structure”. Thus, un-drained landscape “islands” bounded by concrete flatwork and/or foundation wall/slab elements are to be avoided. Installation of rain gutters along the perimeter of the residential structure with drain systems to transport water away from the foundation and to the outfall of the lot is an option to minimize moisture infiltration and fluctuation of bearing soils for structural foundation/floor systems.

In yard areas, it is suggested that, where possible, finished slopes extend a minimum of 10 feet horizontally from building walls and have a minimum vertical fall of 6 inches. Backfill against footings, exterior walls and in utility trenches should be compacted to minimize the possibility of moisture infiltration through loose soil.

Drainage and moisture infiltration should be considered during landscaping design and placement to ensure foundation and slab bearing soils are not exposed to moisture infiltration or moisture content fluctuation. Distance from house structures to vegetative plants, planters, irrigation lines or landscape borders should not be less than 3 feet. Trees should be placed at a distance of 8 feet or more. Landscape irrigation schedules should be adjusted for climatic changes to minimize moisture content fluctuation of foundation bearing soils.

4.5 Slope Stability

Stability of cut and fill slopes are dependent on soil properties such as density, cohesion, moisture content, etc. Site specific laboratory testing and experience indicates that these properties can vary significantly across the site. Temporary slopes for installation of underground utilities or structures should follow OSHA guidelines. A minimum slope of 2.5:1 horizontal to vertical may be utilized for design of cut slopes and compacted fill slopes. The slope recommendation does not consider safety for fall dangers.



4.6 Pavement Section Recommendations

The pavement recommendations have been prepared in accordance with City of Mesa requirements and specifications. The design for local/residential streets, collector and arterial (Crismon Road) pavement sections are based on the surface soil properties and City of Mesa Standard Detail M19.1.

Recommendations for pavement sections utilizing Asphaltic Concrete (AC) Pavement:

Street Classification	AC Surface Course (inches)	AC Base Course (inches)	ABC Fill (inches)
Local Streets/Residential Streets	3.0 (R-1/2")	N/A	6.0
Collector Streets	3.5 (R-3/4")	N/A	6.0
Major Collector	2.0 (A-1/2")	3.5 (A-3/4")	10.0
Arterial Street (Crismon Road)	*2.0 (A-1/2") PMTR+/-	3.5 (A-3/4")	10.0

*PMTR – All new and rehabilitated arterial street surface course asphalt shall be polymer modified terminal blend rubber (PMTR+) per EVAC Criteria

Care should be taken with regard to parkway grading, placement of landscape vegetation and irrigation systems to minimize moisture infiltration in subgrade soils below pavement sections. In addition, the use of monolithic curb/sidewalk combination placement and soil cement of subgrade soils may be considered for long-term performance.

Pavement materials and placement should conform to Maricopa Association of Governments (M.A.G.) specifications. In no case should pavement surfacing be placed on unstable wet subgrade and/or aggregate base course.



5.0 SITE PREPARATION

The following recommendations are presented for site grading. *It is recommended that a ProTeX geotechnical engineer's representative observe and test the earthwork and foundation portions of this project to ensure compliance with this Soil Investigation report.*

Prior to placement of fill a representative of ProTeX should observe the clearing process. Clearing will include removal of: (including but not necessarily limited to):

- Trees, bushes, weeds and associated root systems
- Loose soils in and around the wash
- End dump stockpiles

The areas cleared should be inspected prior to and during scarification for evidence of organic material or loose areas that may require additional removal or processing.

Due to site vegetation, the surface soils should be over-excavated a minimum depth of 1.0 foot below existing grade or 1.0 feet below final pad elevation, whichever is deeper. It is recommended that the over-excavation extend across the entire building pad and to a minimum lateral distance of five feet beyond foundation edges.

After clearing and over-excavation, **the exposed soils should be scarified a minimum of 8 inches, moisture conditioned and compacted.** The surface should be free from ruts, or other uneven features that would tend to prevent uniform compaction by the equipment used.

Sloping areas steeper than 5:1 (horizontal: vertical) should be benched to reduce the potential for slippage between slopes and fills. Benches should be level and wide enough to accommodate compaction and earth moving equipment.

Fill material should be free of organics, vegetative matter, deleterious or foreign material, rocks, and lumps having a diameter of more than 6 inches. Native soils may be used as fill material provided they are compacted as specified. If imported fill material is required, it should be approved very low expansive potential soils.



Fill material should be placed in layers, that when compacted, do not exceed 6 inches. Each layer should then be placed evenly and thoroughly mix during spreading to ensure uniformity of moisture throughout each layer. Each fill layer should be compacted to specified density and moisture content.

Compaction equipment should be able to compact the fill to the specified density. Compaction of each layer should be continuous over its entire area and the compaction equipment should make sufficient passes to ensure that density has been obtained.

Soil compaction is recommended to the following densities and moisture contents as determined in accordance with ASTM D-698, AASHTO T-99 or applicable equivalent:

Compaction Specifications for Post-Tension and Conventional Foundations		
Material	Compaction	Percent Moisture
Below Conventional Foundation Level and Post-Tension Slab-on-Grade	90-95%	Optimum to +4
Fills at Depths 5 to 10 Feet Below Finish Grade	98% Min	-2 to +2 of Optimum
Fills at Depths 10 Feet or Greater Below Finish Grade	100% Min	-2 to +2 of Optimum

A ProTeX geotechnical engineer's representative should observe the grading operations to verify that all cut and fill areas are in accordance with the specifications. This office should be notified prior to earthwork operations so that appropriate observation and materials testing can be provided.

When work is interrupted by heavy rains, fill operations should not be resumed until the geotechnical engineer's representative indicates that the moisture content and density of the previously placed fill are as specified.

If building pads are altered or portions excavated as a part of construction activities, fill soils should be compacted as specified. If pads are not built on for an extended period of time, reconditioning of build pads may be required. Should this be the case, a representative of ProTeX should evaluate the pads for further recommendations.



6.0 CLOSURE

6.1 Limitations

The recommendations contained in this report are based on the assumption that the subsurface conditions do not deviate appreciably from those disclosed by the test holes. Should unusual material or conditions be encountered during construction, the ProTeX geotechnical engineer should be notified to make supplemental recommendations should this be required. This report is issued with the understanding that it is the responsibility of the owner to see that its provisions are carried out or brought to the attention of those concerned.

The scope of services for this project does not include any environmental assessment of the site or identification of contaminated or hazardous materials or conditions.

The findings of this report are considered valid as of the present date. However, changes in the conditions of the site can occur with the passage of time, whether due to natural events or to human activities on this or adjacent sites. In addition, changes in applicable or appropriate codes and standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, this report may become invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and revision as changed conditions are identified.

6.2 Recommended Additional Services

The recommendations provided in this report are based on the assumption that a testing plan will be implemented with an adequate schedule of testing to ensure that the construction process meets the recommendations/specifications presented in this report. The testing and observation should be performed under the direction of the ProTeX Geotechnical Engineer/representative and should include, but not necessarily be limited to the following:

1. Observe and document that the existing surface and subsurface structures, vegetation and abandoned utilities are removed from the site as required in the earthwork section.
2. Approve and document that fill material used as engineered fill in building and pavement areas meets the specifications.

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3. After clearing the site; monitor the over excavation, scarification and removal of any soft/loose conditions down to firm native soils.
4. Monitor and test placement of fill soils in building and pavement locations to verify and document conformance with project specifications.

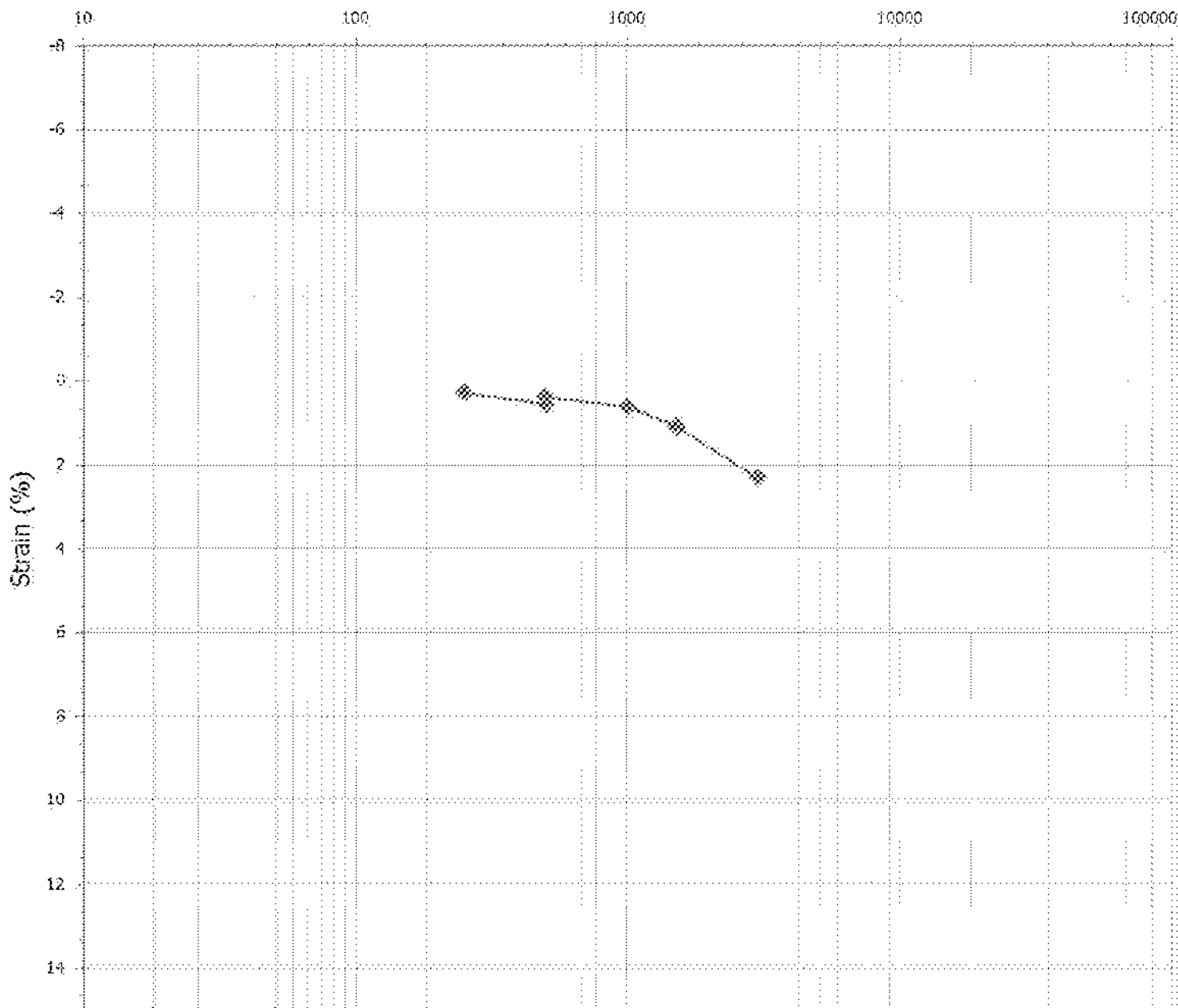
Appendix A



Consolidation

Client: PPGN-Crismon, LLLP Builder: PPGN-Crismon, LLLP Project Name: Cadence
Job Name: Phases 2 and 3 Lab Number: 185104
Job ID #: 8144 Received: 8/1/2018 Sampled: 7/30/2018
Material: Geo Samples - Native Sampled By: Spencer Drenth
Material Source: On-Site Submitted By: _____

Load (PSF)



Source:

1314 - Rings 5'

Moisture Content: 3.8 %

Sample Type: Undisturbed

Dry Unit Weight: 101.9 lb/ft³

Load at Saturation: 500 PSF

Remarks:

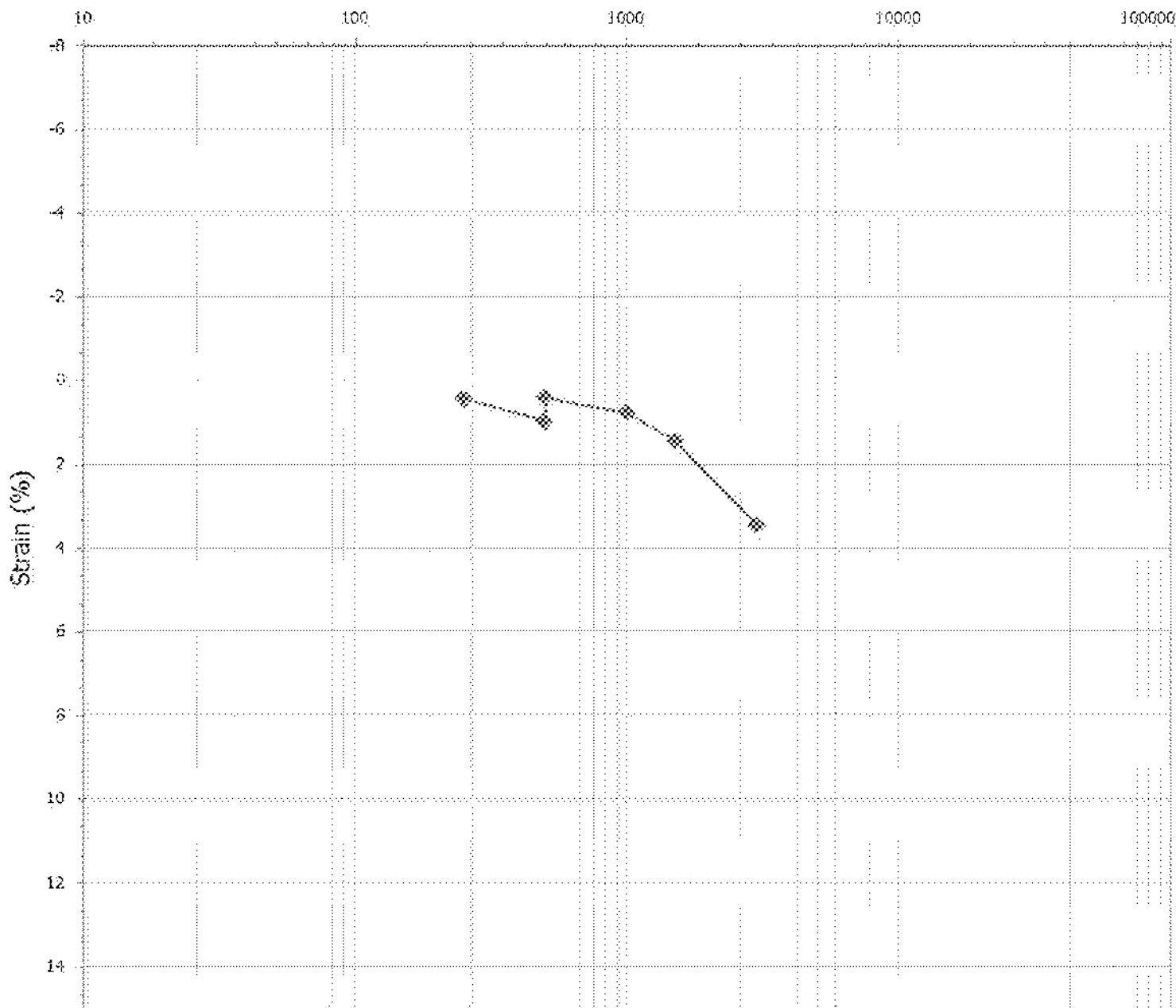
Reviewed By: jgrossarth



Consolidation

Client: PPGN-Crismon, LLLP Builder: PPGN-Crismon, LLLP Project Name: Cadence
Job Name: Phases 2 and 3 Lab Number: 185107
Job ID #: 8144 Received: 8/1/2018 Sampled: 7/30/2018
Material: Geo Samples - Native Sampled By: Spencer Drenth
Material Source: On-Site Submitted By: _____

Load (PSF)



Source:

B19 - Rings 1.5'

Moisture Content: 6.0 %

Sample Type: Undisturbed

Dry Unit Weight: 90.4 lb/ft³

Load at Saturation: 500 PSF

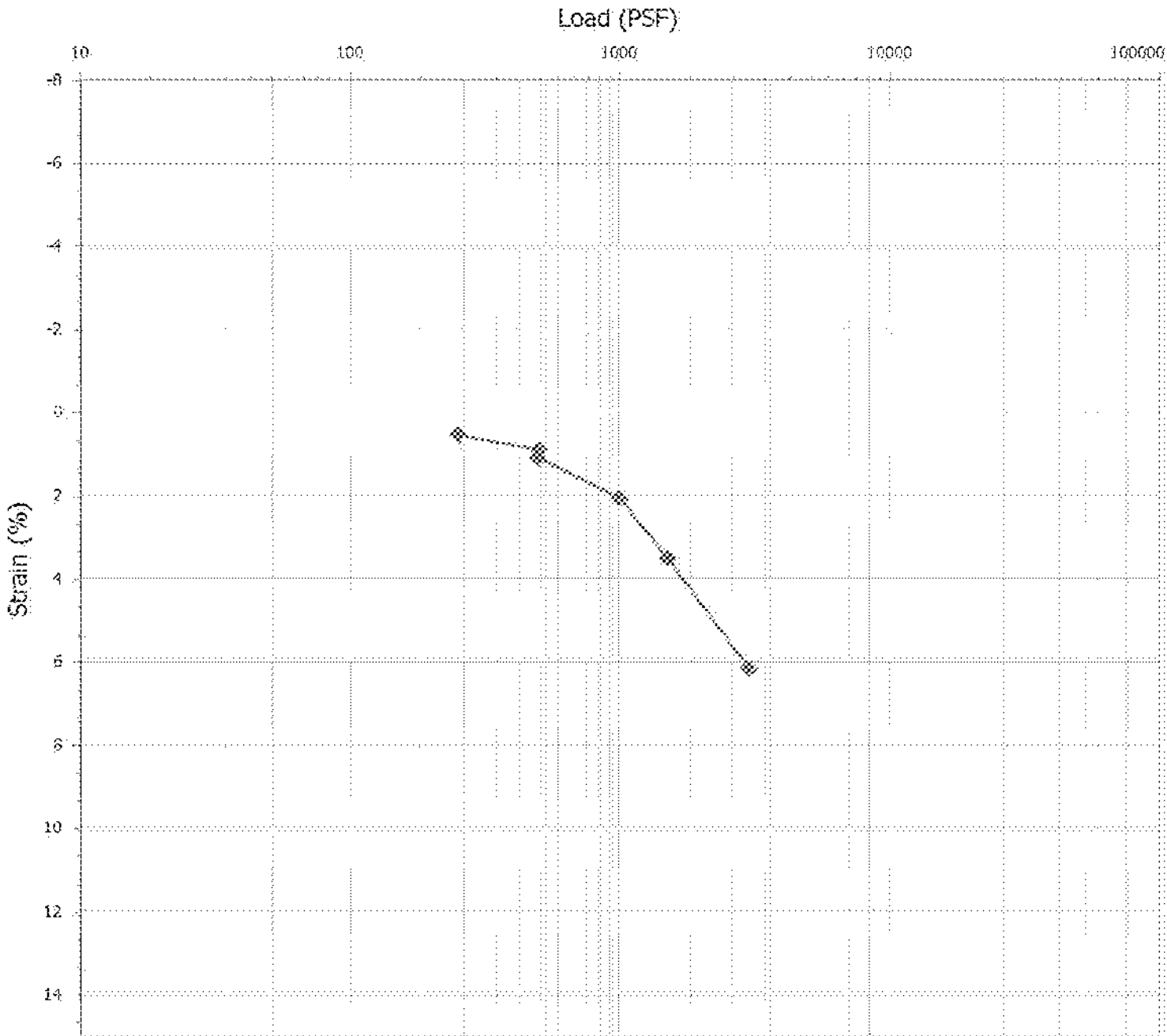
Remarks:

Reviewed By: jgrossarth



Consolidation

Client: PPGN-Crismon, LLLP Builder: PPGN-Crismon, LLLP Project Name: Cadence
Job Name: Phases 2 and 3 Lab Number: 185109
Job ID #: 8144 Received: 8/1/2018 Sampled: 7/30/2018
Material: Geo Samples - Native Sampled By: Spencer Drenth
Material Source: On-Site Submitted By: _____



Source:

B22 - Rings 5'

Moisture Content: 4.0 %

Sample Type: Undisturbed

Dry Unit Weight: 92.6 lb/ft³

Load at Saturation: 500 PSF

Remarks:

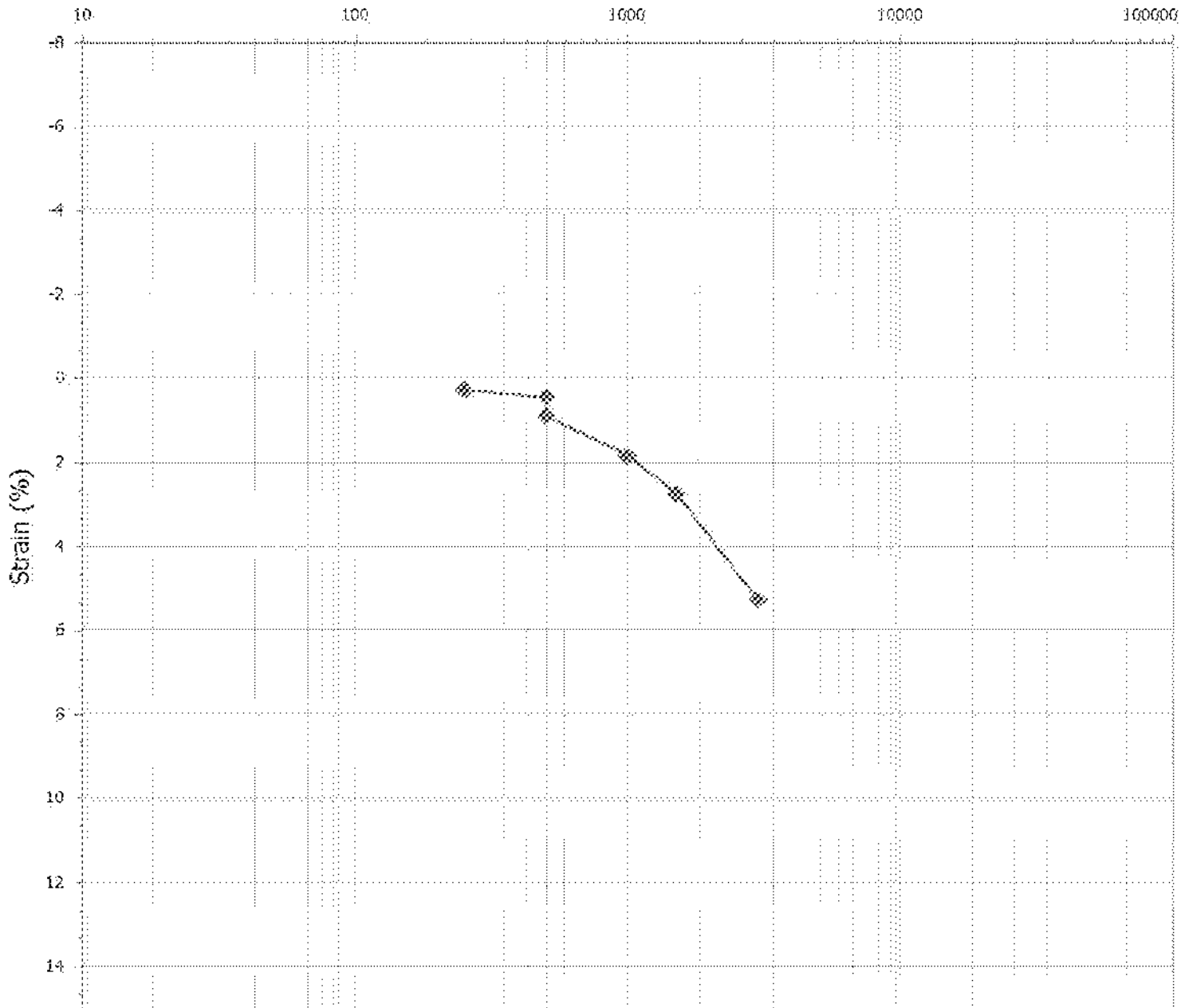
Reviewed By: grossarth



Consolidation

Client: PPGN-Crismon, LLLP Builder: PPGN-Crismon, LLLP Project Name: Cadence
Job Name: Phases 2 and 3 Lab Number: 185119
Job ID #: 8144 Received: 8/1/2018 Sampled: 7/30/2018
Material: Geo Samples - Native Sampled By: Spencer Drenth
Material Source: On-Site Submitted By: _____

Load (PSF)



Source: B2.5 - Rings 1.5'

Moisture Content: 4.7 %

Sample Type: Undisturbed

Dry Unit Weight: 97.7 lb/ft³

Load at Saturation: 500 PSF

Remarks:

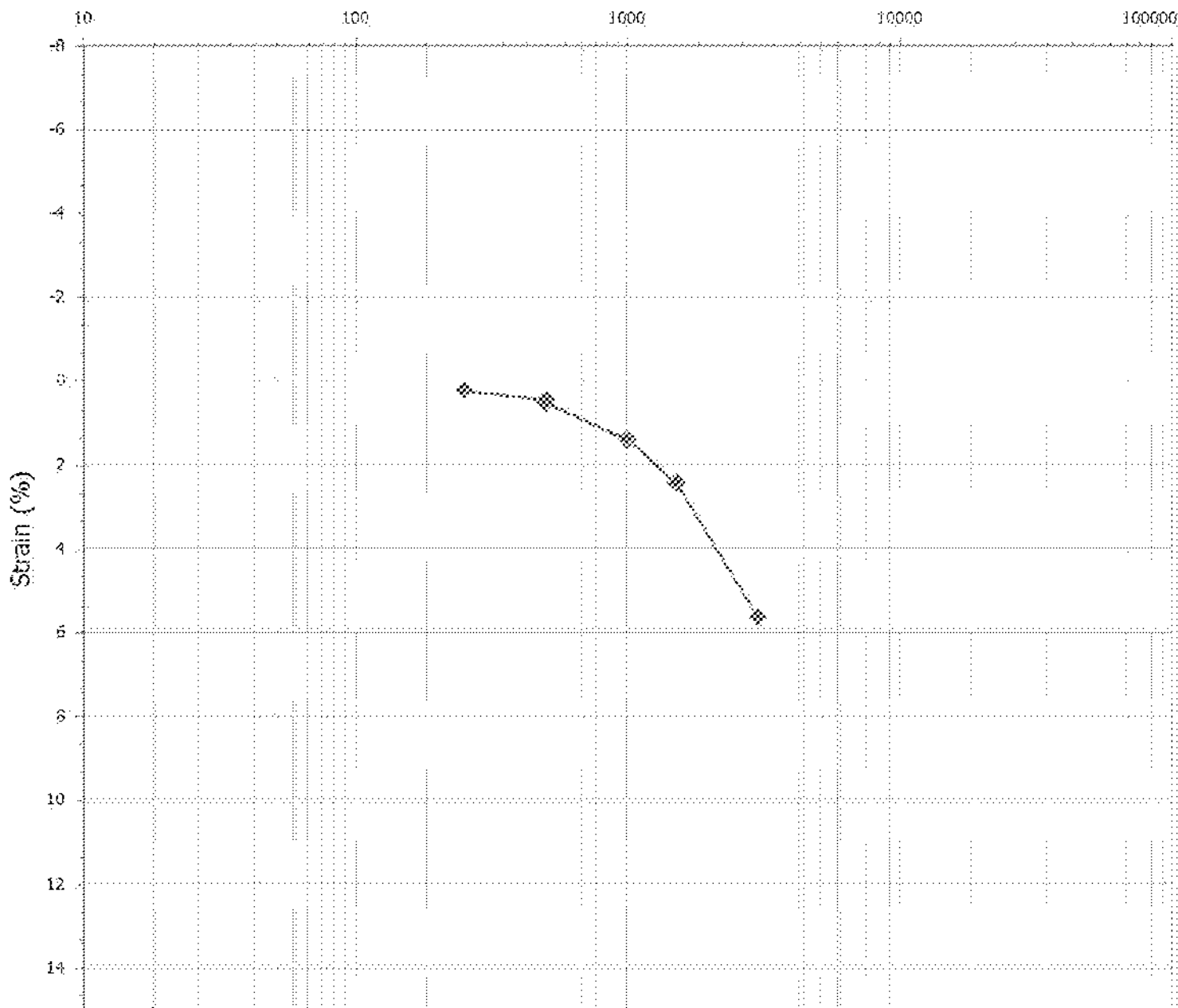
Reviewed By: jgrossarth



Consolidation

Client: PPGN-Crismon, LLLP Builder: PPGN-Crismon, LLLP Project Name: Cadence
Job Name: Phases 2 and 3 Lab Number: 185111
Job ID #: 8144 Received: 8/1/2018 Sampled: 7/30/2018
Material: Geo Samples - Native Sampled By: Spencer Drenth
Material Source: On-Site Submitted By: _____

Load (PSF)



Source: B30 - Rings 1.5'

Moisture Content: 7.0 %

Sample Type: Undisturbed

Dry Unit Weight: 86.7 lb/ft³

Load at Saturation: 500 PSF

Remarks:

Reviewed By: jgrossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B1 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185039 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	25
Plastic Limit	15
Plasticity Index	10

ASTM D4829		
Expansion Index, (EI)	Potential Expansion	Expansion Index EI = 29
0 - 20	Very Low	
21 - 51	Low	
52 - 90	Medium	
91 - 130	High	
> 130	Very High	

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Lean clay with sand
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	92		
#100	86		
#200	79		

Remarks:

Reviewed By:

Jerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B1 (5-7')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185040 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	30
Plastic Limit	12
Plasticity Index	18

ASTM D4829		
Expansion Index, (EI)	Potential Expansion	Expansion Index EI = 30
0 - 20	Very Low	
21 - 51	Low	
52 - 90	Medium	
91 - 130	High	
> 130	Very High	

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	96		
#40	84		
#100	71		
#200	61		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B2 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185041 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	24
Plastic Limit	15
Plasticity Index	9

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Class: Lean clay with sand

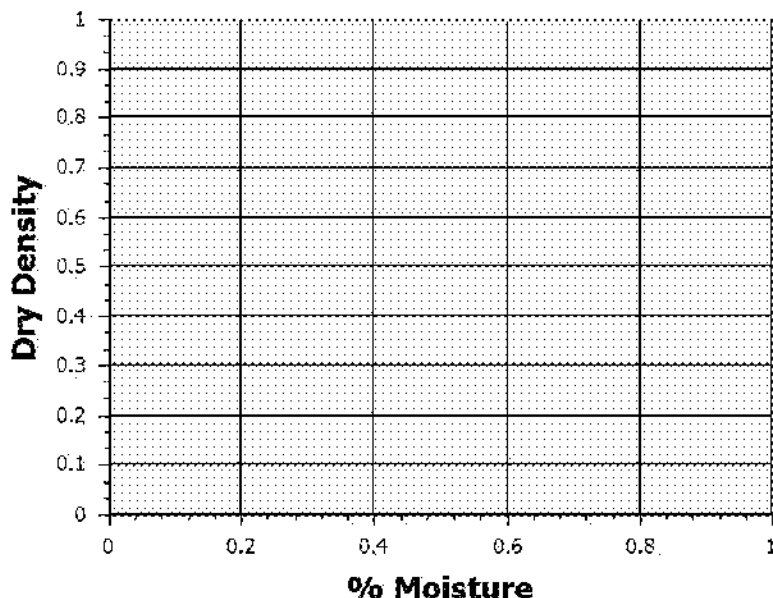
Symbol: CL

AASHTO T292	
Moisture Density (Proctor)	
Max. Dry Density	116.9
Opt. Moisture %	13.6
Corr. Max. Dry Density	117.0
Corr. Opt. Moisture %	13.6
% Rock	0

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	94		
#100	86		
#200	77		

Moisture Vs. Density



Remarks:

Reviewed By:

[Signature]
 Jerald W Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B2 (7-9')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185042 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	31
Plastic Limit	18
Plasticity Index	13

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	93		
#100	77		
#200	64		

Remarks:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B3 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185043 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	22
Plastic Limit	14
Plasticity Index	8

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	2

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	99		
#4	98		
#10	96		
#40	86		
#100	72		
#200	59		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B4 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185044 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	21
Plastic Limit	13
Plasticity Index	8

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	96		
#40	83		
#100	66		
#200	54		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B4 (4-6')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185045 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	30
Plastic Limit	18
Plasticity Index	12

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	97		
#40	89		
#100	77		
#200	66		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B5 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185046 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	23
Plastic Limit	12
Plasticity Index	11

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	2

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	98		
#10	94		
#40	79		
#100	66		
#200	54		

Remarks:

Reviewed By:

Gerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B6 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185047 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	22
Plastic Limit	15
Plasticity Index	7

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Silty clay with sand
 Symbol: CL-ML

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	99		
#40	95		
#100	87		
#200	76		

Remarks:

Reviewed By:

Gerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B6 (8-10')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185048 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	37
Plastic Limit	20
Plasticity Index	17

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Lean clay with sand
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	98		
#40	95		
#100	87		
#200	77		

Remarks:

Reviewed By:

Gerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B7 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185049 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	23
Plastic Limit	13
Plasticity Index	10

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	3

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	97		
#10	93		
#40	79		
#100	66		
#200	54		

Remarks:

Reviewed By:

Jerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B8 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185050 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	25
Plastic Limit	14
Plasticity Index	11

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	98		
#40	89		
#100	75		
#200	65		

Remarks:

Reviewed By:

Gerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B8 (5-7')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185051 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	24
Plastic Limit	15
Plasticity Index	9

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	98		
#40	92		
#100	80		
#200	66		

Remarks:

Reviewed By:

Jerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B9 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185052 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	24
Plastic Limit	15
Plasticity Index	9

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Clayey sand

Symbol: SC

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	96		
#40	77		
#100	58		
#200	49		

Remarks:

Reviewed By:

Gerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B9 (5-7')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185053 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	30
Plastic Limit	16
Plasticity Index	14

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Clayey sand

Symbol: SC

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	2

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	98		
#10	91		
#40	69		
#100	52		
#200	43		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B10 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185054 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	27
Plastic Limit	14
Plasticity Index	13

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Clayey gravel with sand
 Symbol: GC

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	27

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	89		
#4	73		
#10	63		
#40	47		
#100	37		
#200	31		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B11 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185055 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	25
Plastic Limit	15
Plasticity Index	10

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	5

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	95		
#10	92		
#40	83		
#100	72		
#200	60		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B11 (5-7)

ProTeX Job No.: 8144
 ProTeX Lab No.: 185056 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	35
Plastic Limit	17
Plasticity Index	18

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Lean clay with sand
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	2

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	98		
#10	96		
#40	90		
#100	83		
#200	72		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B12 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185057 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	NV
Plastic Limit	NP
Plasticity Index	NP

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Silty sand
 Symbol: SM

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	5

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	95		
#10	92		
#40	78		
#100	55		
#200	39		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B13 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185058 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	23
Plastic Limit	14
Plasticity Index	9

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	96		
#40	82		
#100	65		
#200	52		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B13 (6-8')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185059 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	25
Plastic Limit	15
Plasticity Index	10

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	98		
#40	90		
#100	74		
#200	61		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B14 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185060 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	19
Plastic Limit	13
Plasticity Index	6

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy silty clay
 Symbol: CL-ML

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	98		
#40	84		
#100	68		
#200	55		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B14 (10-12')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185061 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	25
Plastic Limit	17
Plasticity Index	8

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Clayey sand

Symbol: SC

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	2

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	98		
#10	94		
#40	81		
#100	60		
#200	46		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B15 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185062 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	29
Plastic Limit	14
Plasticity Index	15

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	2

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	99		
#4	98		
#10	96		
#40	87		
#100	72		
#200	59		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B16 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185063 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	23
Plastic Limit	13
Plasticity Index	10

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	98		
#40	82		
#100	67		
#200	58		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B16 (4-6')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185064 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	33
Plastic Limit	17
Plasticity Index	16

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Lean clay with sand
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	93		
#100	85		
#200	74		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B17 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185065 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	20
Plastic Limit	15
Plasticity Index	5

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Silty, clayey sand
 Symbol: SC-SM

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	94		
#40	65		
#100	51		
#200	39		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B18 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185066 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	22
Plastic Limit	14
Plasticity Index	8

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Clayey sand

Symbol: SC

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	95		
#40	74		
#100	58		
#200	47		

Remarks:

Reviewed By:

Gerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B18 (6-8')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185067 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	35
Plastic Limit	15
Plasticity Index	20

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	91		
#100	81		
#200	69		

Remarks:

Reviewed By:

Jerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B19 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185068 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	22
Plastic Limit	15
Plasticity Index	7

ASTM D4829		
Expansion Index, (EI)	Potential Expansion	Expansion Index EI = 31
0 - 20	Very Low	
21 - 51	Low	
52 - 90	Medium	
91 - 130	High	
> 130	Very High	

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy silty clay
 Symbol: CL-ML

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	98		
#40	92		
#100	80		
#200	66		

Remarks:

Reviewed By:

Gerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B20 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185069 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	28
Plastic Limit	14
Plasticity Index	14

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Lean clay with sand
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	88		
#100	77		
#200	70		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B20 (5-7)

ProTeX Job No.: 8144
 ProTeX Lab No.: 185070 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	32
Plastic Limit	14
Plasticity Index	18

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Lean clay with sand
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	98		
#40	94		
#100	87		
#200	79		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B21 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185071 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	24
Plastic Limit	14
Plasticity Index	10

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	89		
#100	79		
#200	69		

Remarks:

Reviewed By:

Gerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B22 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185072 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	23
Plastic Limit	15
Plasticity Index	8

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Lean clay with sand
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	99		
#4	99		
#10	98		
#40	91		
#100	81		
#200	71		

Remarks:

Reviewed By:

Jerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B23 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185074 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	NV
Plastic Limit	NP
Plasticity Index	NP

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Silty sand

Symbol: SM

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	89		
#40	43		
#100	20		
#200	15		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B24 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185075 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	22
Plastic Limit	14
Plasticity Index	8

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	90		
#100	75		
#200	61		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B24 (6-8')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185076 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	30
Plastic Limit	17
Plasticity Index	13

ASTM D4829		
Expansion Index, (EI)	Potential Expansion	Expansion Index EI = 26
0 - 20	Very Low	
21 - 51	Low	
52 - 90	Medium	
91 - 130	High	
> 130	Very High	

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T117/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	97		
#40	91		
#100	80		
#200	68		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B25 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185077 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	23
Plastic Limit	13
Plasticity Index	10

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	2

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	99		
#4	98		
#10	96		
#40	81		
#100	65		
#200	52		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B26 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185078 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	24
Plastic Limit	14
Plasticity Index	10

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Lean clay with sand
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	98		
#40	91		
#100	81		
#200	71		

Remarks:

Reviewed By:

Jerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B26 (6-8')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185079 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	25
Plastic Limit	15
Plasticity Index	10

ASTM D4829		
Expansion Index, (EI)	Potential Expansion	Expansion Index EI = 26
0 - 20	Very Low	
21 - 51	Low	
52 - 90	Medium	
91 - 130	High	
> 130	Very High	

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Lean clay with sand
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	94		
#100	83		
#200	71		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B27 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185080 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	23
Plastic Limit	13
Plasticity Index	10

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	98		
#40	88		
#100	75		
#200	63		

Remarks:

Reviewed By:

Gerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B28 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185082 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	24
Plastic Limit	16
Plasticity Index	8

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Lean clay with sand
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	99		
#40	94		
#100	84		
#200	73		

Remarks:

Reviewed By:

Gerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B28 (6-8')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185081 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	25
Plastic Limit	18
Plasticity Index	7

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Silty clay with sand
 Symbol: CL-ML

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	96		
#40	90		
#100	84		
#200	76		

Remarks:

Reviewed By:

Jerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B29 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185083 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	25
Plastic Limit	14
Plasticity Index	11

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

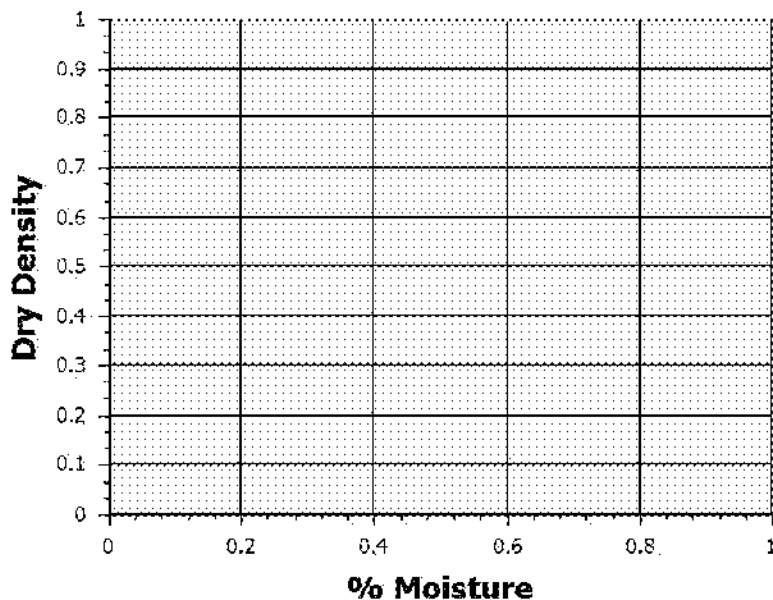
Class: Lean clay with sand
 Symbol: CL

AASHTO T292	
Moisture Density (Proctor)	
Max. Dry Density	111.3
Opt. Moisture %	16.1
Corr. Max. Dry Density	111.4
Corr. Opt. Moisture %	16.1
% Rock	0

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	96		
#100	89		
#200	80		

Moisture Vs. Density



Remarks:

Reviewed By:

[Signature]
 Jerald W Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B30 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185084 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	23
Plastic Limit	15
Plasticity Index	8

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Lean clay with sand
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	95		
#100	85		
#200	73		

Remarks:

Reviewed By:

Jerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B31 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185086 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	20
Plastic Limit	14
Plasticity Index	6

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Silty clay with sand

Symbol: CL-ML

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	93		
#100	84		
#200	72		

Remarks:

Reviewed By:

Jerald W. Grossarth



ProTeX the PT Xperts LLC
 1102 W. Southern Ave., Ste. 400 Office: (602)-272-7891
 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B33 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185087 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	19
Plastic Limit	14
Plasticity Index	5

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Silty, clayey sand
 Symbol: SC-SM

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	7

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	96		
#4	93		
#10	90		
#40	74		
#100	53		
#200	40		

Remarks:

Reviewed By:

Gerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B34 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185088 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	22
Plastic Limit	14
Plasticity Index	8

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	91		
#100	82		
#200	70		

Remarks:

Reviewed By:
 Gerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: B34 (5-7)

ProTeX Job No.: 8144
 ProTeX Lab No.: 185089 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	19
Plastic Limit	15
Plasticity Index	4

ASTM D4829

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index

EI = 12

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy silty clay
 Symbol: CL-ML

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	5

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	98		
#4	95		
#10	92		
#40	80		
#100	63		
#200	52		

Remarks:

Reviewed By:

Gerald W. Grossarth



ProTeX the PT Xperts LLC
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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: BC1 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185090 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	24
Plastic Limit	14
Plasticity Index	10

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Lean clay with sand
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	97		
#100	90		
#200	78		

Remarks:

Reviewed By:

Jerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: BC2 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185091 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	21
Plastic Limit	14
Plasticity Index	7

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy silty clay
 Symbol: CL-ML

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	89		
#100	77		
#200	64		

Remarks:

Reviewed By:

Jerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: BC3 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185092 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	23
Plastic Limit	14
Plasticity Index	9

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	98		
#40	86		
#100	69		
#200	54		

Remarks:

Reviewed By:

Jerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: BC4 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185093 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	NV
Plastic Limit	NP
Plasticity Index	NP

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Silty sand
 Symbol: SM

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	95		
#40	65		
#100	45		
#200	36		

Remarks:

Reviewed By:

Gerald W. Grossarth



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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: BC5 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185094 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	24
Plastic Limit	15
Plasticity Index	9

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	98		
#40	90		
#100	81		
#200	70		

Remarks:

Reviewed By:

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Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: BC6 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185095 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	30
Plastic Limit	16
Plasticity Index	14

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	98		
#100	94		
#200	85		

Remarks:

Reviewed By:

Jerald W. Grossarth



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 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: BC7 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185096 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	21
Plastic Limit	14
Plasticity Index	7

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Silty, clayey sand
 Symbol: SC-SM

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	96		
#40	76		
#100	59		
#200	47		

Remarks:

Reviewed By:

Gerald W. Grossarth



ProTeX the PT Xperts LLC
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 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: BC8 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185097 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	22
Plastic Limit	13
Plasticity Index	9

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Class: Clayey sand

Symbol: SC

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	99		
#10	96		
#40	77		
#100	62		
#200	49		

Remarks:

Reviewed By:

Jerald W. Grossarth



ProTeX the PT Xperts LLC
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 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: BC9 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185098 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	22
Plastic Limit	14
Plasticity Index	8

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	91		
#100	77		
#200	66		

Remarks:

Reviewed By:

Gerald W. Grossarth



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 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: BC19 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185099 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	26
Plastic Limit	14
Plasticity Index	12

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Lean clay with sand
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	2

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	98		
#10	98		
#40	93		
#100	83		
#200	72		

Remarks:

Reviewed By:

Gerald W. Grossarth



ProTeX the PT Xperts LLC
 1102 W. Southern Ave., Ste. 4- Office: (602)-272-7891
 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: BC11 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185100 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	25
Plastic Limit	15
Plasticity Index	10

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Lean clay with sand
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	95		
#100	89		
#200	80		

Remarks:

Reviewed By:

Gerald W. Grossarth



ProTeX the PT Xperts LLC
 1102 W. Southern Ave., Ste. 400 Office: (602)-272-7891
 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: PPGN-Crismon, LLP
 Project Name: Cadence
 Job Name: Phases 2 and 3
 Material: Geo Samples - Native (On-Site)
 Material Supplier: -
 Sample Location: BC12 (0-3')

ProTeX Job No.: 8144
 ProTeX Lab No.: 185101 - Phoenix
 Date Received: 8/1/2018
 Sampled By: Spencer Drandi
 Date Sampled: 7/30/2018
 Submitted By:

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	22
Plastic Limit	12
Plasticity Index	10

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm):	NA

Class: Sandy lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	3

* = out of specification

AASHTO T11/T22			
Sieve	% Pass	Specs.	*
1"	100		
1/2"	99		
#4	97		
#10	93		
#40	83		
#100	72		
#200	64		

Remarks:

Reviewed By:

Gerald W. Grossarth

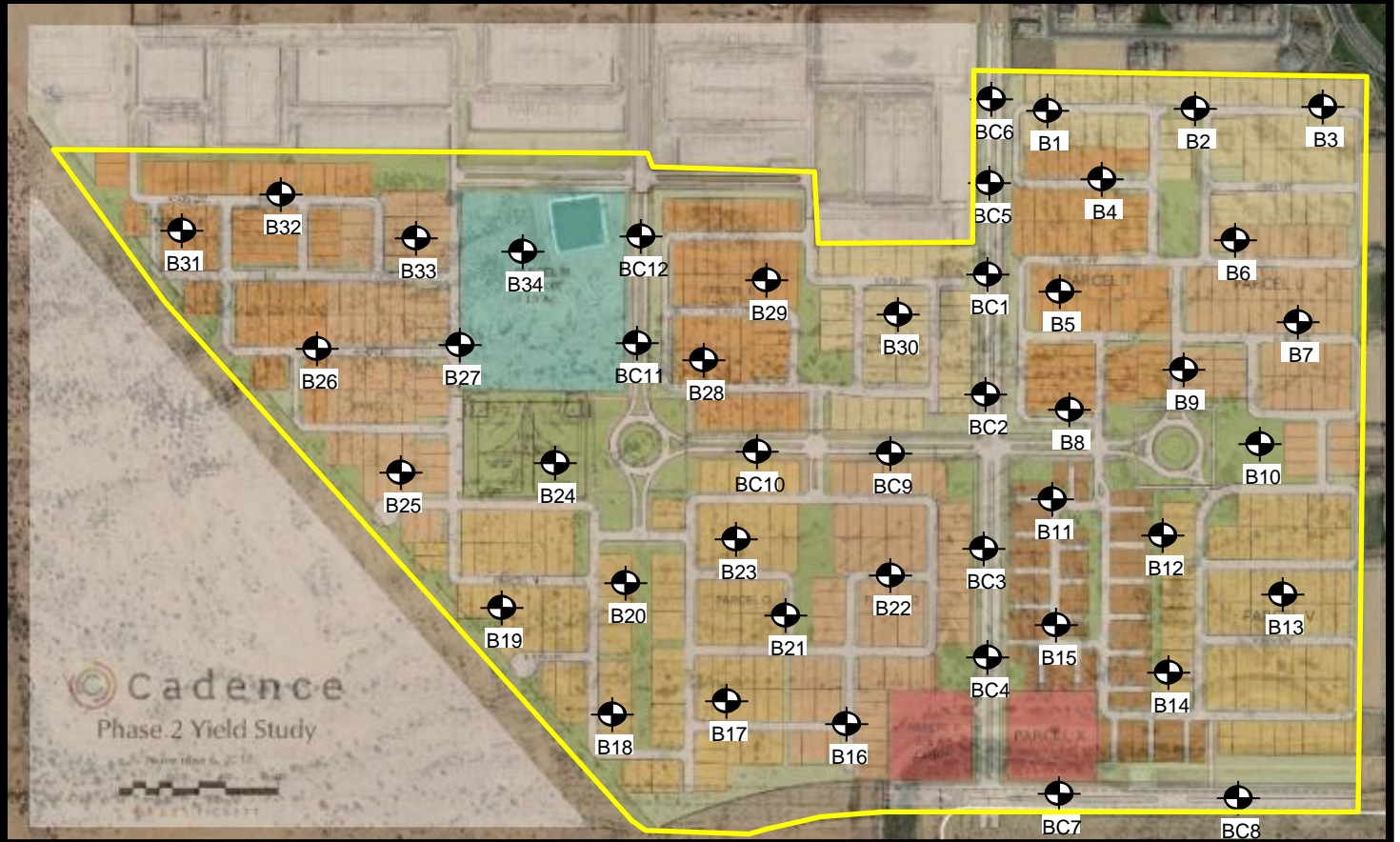


Summary of Laboratory Test Results Potential for Corrosion

Client: PPGN-Crismon, LLC Builder: PPGN-Crismon, LLC Project Name: Cadenac
Job Name: Phases 2 and 3 Job ID #: RL44

ProTeX Lab#	Location	Depth	Material Type	Sample Date	Sulfate (SO ₄) (ppm)	Chloride (CL-) (ppm)	Soluble Salts (ppm)	Minimum Resistivity (ohms-cm)	pH	Oxidation- Reduction Potential of Water (mV)
185039	B1	0-3'	Geo Samples - Native	7/30/2018	255	16				
185052	B39	0-3'	Geo Samples - Native	7/30/2018	95	9				
185058	B13	0-3'	Geo Samples - Native	7/30/2018	98	6				
185065	B17	0-3'	Geo Samples - Native	7/30/2018	58	1				
185077	B25	0-3'	Geo Samples - Native	7/30/2018	66	1				
185086	B31	0-3'	Geo Samples - Native	7/30/2018	88	4				

Appendix B



Legend:



Approximate Test Hole Location



Site Plan

Scale: N.T.S.

Drawn by: SD.

Date: 8/21/2018

Cadence - Phases 2 and 3

Ellsworth Road and Guadalupe Road
Mesa, Arizona



ProTeX Job No.: 8144

Appendix C



LOG OF BORING No. B1

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.


Depth (feet)	Description	Graphic	Sample No.	Blow Counts	TEST RESULTS	
					Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85039	79	Water Content - ●	Penetration -
2.5						
5						
7.5						
10						
12.5						
15	Boring terminated at 15 ft.					
17.5						



LOG OF BORING No. B2

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.



Depth (feet)	Description	Graphic	Sample No.	Blow Counts	TEST RESULTS	
					Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		8504	77	Water Content - ●	
					Penetration - 	
2.5				4 6 6		
5				6 6 6		
7.5			85042	64		
10						
12.5						
15	Boring terminated at 15 ft.					
17.5						



LOG OF BORING No. B3

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.


Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS				
						Plastic Limit				Liquid Limit
						Water Content -	●			
						Penetration -				
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85043		59	10	20	30	40	50
2.5										
5										
7.5										
10										
12.5										
15										
	Boring terminated at 15 ft.									
17.5										



LOG OF BORING No. B4

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.



Depth (feet)	Description	Graphic	Sample No.	Blow Counts	TEST RESULTS	
					Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85044	54	Water Content - ●	Penetration - 
2.5				699		
5			85045	66		
7.5				61012		
10						
12.5						
15	Boring terminated at 15 ft.					
17.5						



LOG OF BORING No. B5

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:** _____
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ _____ **AFTER 24 HOURS:** ∇ _____ **CAVING> C:** _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS				
						Plastic Limit			Liquid Limit	
						Water Content -	•			
						Penetration -				
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85046		54	10	20	30	40	50
2.5										
5										
7.5										
10										
12.5										
15										
	Boring terminated at 15 ft.									
17.5										



LOG OF BORING No. B6

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	TEST RESULTS	
					Plastic Limit	Liquid Limit
0	(CL-ML) Silty Clay with Sand, low plasticity, slightly damp, tan		85047	76	Water Content - ●	
2.5					Penetration -	
5						
7.5						
8-10	(CL) Sandy Clay, medium plasticity, slightly damp, light brown					
10						
12.5						
15	Boring terminated at 15 ft.					
17.5						



LOG OF BORING No. B7

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION:
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: AFTER 24 HOURS: CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.



Depth (feet)	Description	Graphic	Sample No.	Blow Counts	TEST RESULTS	
					Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85049	54	Water Content - ●	Penetration - ■
2.5				7 8 11		
5				6 6 9		
7.5						
10						
12.5						
15	Boring terminated at 15 ft.					
17.5						



LOG OF BORING No. B8

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:** _____
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ **AFTER 24 HOURS:** ▽ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85050		65	Water Content - ●	
2.5						Penetration - 	
5						10 20 30 40 50	
7.5							
10							
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. B9

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.



Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(SC) Clayey Sand, low-medium plasticity, slightly damp, light brown		85052			Water Content - ●	
2.5						Penetration -	
5							
7.5							
10							
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. B10

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS			
						Plastic Limit	Liquid Limit		
						Water Content - ●			
						Penetration - 			
0	(GC) Clayey Gravel, low-medium plasticity, slightly damp, brown		85054						
2.5									
5									
7.5									
10									
12.5									
15	Boring terminated at 15 ft.								
17.5									



LOG OF BORING No. B11

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.


Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85055	R 8		Water Content - ●	
2.5						Penetration -	
5	soil transitions to medium plasticity		85056	R 16			
7.5							
10							
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. B12

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS				
						Plastic Limit	Liquid Limit			
0	(SM) Silty Sand, non-plastic, slightly damp, light brown		85057			Water Content - ●	Penetration - 			
2.5										
5										
7.5										
10										
12.5										
15	Boring terminated at 15 ft.									
17.5										



LOG OF BORING No. B13

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85058	6		30	30
2.5				6			
5				8			
7.5				11			
10				9			
12.5							
15	Boring terminated at 15 ft.						
17.5							

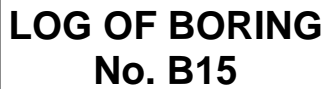


LOG OF BORING No. B14



PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL-ML) Silty Clay with Sand, low plasticity, slightly damp, tan		85060	R 10 12		Water Content - ●	Penetration -
2.5							
5				R 7 9			
7.5							
10	(SC) Clayey Sand, low-medium plasticity, slightly damp, light brown		85061	10-12			
12.5							
15	Boring terminated at 15 ft.						
17.5							



PROJECT: Cadence Phases 2 and 3		PROJECT NO.: 8144	
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP			
PROJECT LOCATION: Ellsworth Road and Guadalupe Road			
LOCATION: See Site Map		ELEVATION:	
DRILLER: D&S Drilling		LOGGED BY: SD	
DRILLING METHOD: 8" Power Auger		DATE: 7/27/2018	
DEPTH TO - WATER> INITIAL: ∇		AFTER 24 HOURS: ∇	
		CAVING> C	

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS				
						Plastic Limit ----- Liquid Limit				
						Water Content - ●				
						Penetration - 				
0	(CL) Sandy Clay, medium plasticity, slightly damp, light brown		85062			10	20	30	40	50
2.5										
5										
7.5										
10										
12.5										
15	Boring terminated at 15 ft.									
17.5										



LOG OF BORING No. B16

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85063			Water Content - ●	
2.5						Penetration -	
5	soil transitions to medium plasticity		85064				
7.5							
10							
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. B17

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:** _____
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ _____ **AFTER 24 HOURS:** ∇ _____ **CAVING>** C. _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(SC-SM) Silty Clayey Sand, low plasticity, slightly damp, light brown		85065			Water Content - ●	
				R 8 12		Penetration -	
2.5							
5				R 14 19			
7.5							
10							
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. B18

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(SC) Clayey Sand, low-medium plasticity, slightly damp, light brown		85066			Water Content - ●	
2.5						Penetration -	
5							
6.8	(CL) Sandy Clay, medium plasticity, slightly damp, light brown		85067				
7.5							
10							
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. B19

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL-ML) Silty Clay with Sand, low plasticity, slightly damp, tan		85068	R 11 13		Water Content - ●	
2.5						Penetration -	
5							
7.5							
10							
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. B20

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85069			Water Content - ●	
2.5						Penetration -	
5	soil transitions to medium plasticity		85070				
7.5							
10							
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. B21

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.


Depth (feet)	Description	Graphic	Sample No.	Blow Counts	TEST RESULTS	
					Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		8507		Water Content - ●	
					Penetration -	
2.5				6 6 7		
5				13 19 22		
7.5						
10						
12.5						
15	Boring terminated at 15 ft.					
17.5						



LOG OF BORING No. B22

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.


Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85072			Water Content - ●	
				R 5 9		Penetration - 	
2.5							
5				R 15 19			
7.5			85073				
10							
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. B23

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS				
						Plastic Limit	Liquid Limit			
0	(SM) Silty Sand, non-plastic, slightly damp, tan		85074			Water Content - ●	Penetration - 			
2.5										
5										
7.5										
10										
12.5										
15	Boring terminated at 15 ft.									
17.5										



LOG OF BORING No. B24

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85075			Water Content - ●	
						Penetration -	
2.5							
5							
7.5			85076				
10							
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. B25

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85077			Water Content - ●	
						Penetration -	
2.5				R 9 13			
5				R 11 24			
7.5							
10							
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. B26

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:** _____
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ **AFTER 24 HOURS:** ▽ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85078			Water Content - ●	
2.5						Penetration -	
5							
7.5			85079				
10							
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. B27

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.




Depth (feet)	Description	Graphic	Sample No.	Blow Counts	TEST RESULTS	
					Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85080	6	Water Content - ●	Penetration -
2.5				6		
5				7		
7.5				12		
10				14		
12.5						
15	Boring terminated at 15 ft.					
17.5						



LOG OF BORING No. B28

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85081			Water Content - ●	
2.5						Penetration - 	
5							
6.8	(CL-ML) Silty Clay with Sand, low plasticity, slightly damp, tan		85082				
7.5							
10							
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. B29

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:** _____
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ **AFTER 24 HOURS:** ▽ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS			
						Plastic Limit	Liquid Limit		
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85083			Water Content - ●			
						Penetration -			
2.5									
5									
7.5									
10									
12.5									
15	Boring terminated at 15 ft.								
17.5									



LOG OF BORING No. B30

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

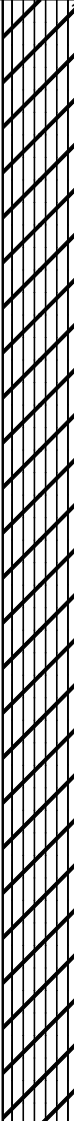
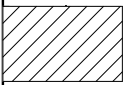
Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85084				
2.5				R 6 7			
5				R 9 11			
7.5							
8-10	(CL-ML) Silty Clay with Sand, low plasticity, slightly damp, tan		85085				
10							
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. B31

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL-ML) Silty Clay with Sand, low plasticity, slightly damp, tan		85086	R 8 11		Water Content - ●	
2.5						Penetration - 	
5							
7.5							
10							
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. B32

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:** _____
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ **AFTER 24 HOURS:** ▽ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS					
						Plastic Limit		Liquid Limit			
						Water Content -		•			
						Penetration -		▨			
0	(SM) Silty Sand, non-plastic, slightly damp, tan		85087			10	20	30	40	50	
2.5											
5											
7.5											
10	Boring terminated at 15 ft.										
12.5											
15											
17.5											



LOG OF BORING No. B33

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS			
						Plastic Limit	Liquid Limit		
0	(SC-SM) Silty Clayey Sand, low plasticity, slightly damp, light brown		85088			Water Content - ●			
						Penetration -			
2.5									
5									
7.5									
10									
12.5									
15	Boring terminated at 15 ft.								
17.5									



LOG OF BORING No. B34

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85089	6			
2.5				11			
5	(CL-ML) Silty Clay with Sand, low plasticity, slightly damp, tan		85090	7			
7.5				9			
10				9			
12.5							
15	Boring terminated at 15 ft.						
17.5							



LOG OF BORING No. BC1

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS			
						Plastic Limit	Liquid Limit		
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		8509			Water Content - ●			
						Penetration -			
2.5									
5	Boring terminated at 5 ft.								
7.5									
10									
12.5									
15									
17.5									



LOG OF BORING No. BC2

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS			
						Plastic Limit	Liquid Limit		
0	(CL-ML) Silty Clay with Sand, low plasticity, slightly damp, tan		85092			Water Content - ●			
						Penetration -			
2.5									
5	Boring terminated at 5 ft.								
7.5									
10									
12.5									
15									
17.5									



LOG OF BORING No. BC3

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ AFTER 24 HOURS: ∇ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.


Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS			
						Plastic Limit	Liquid Limit		
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85093			Water Content - ●			
						Penetration -			
2.5									
5	Boring terminated at 5 ft.								
7.5									
10									
12.5									
15									
17.5									



LOG OF BORING No. BC4

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:** _____
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ _____ **AFTER 24 HOURS:** ∇ _____ **CAVING>** C _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS			
						Plastic Limit	Liquid Limit		
0	(SM) Silty Sand, non-plastic, slightly damp tan		85094			Water Content - ●	Penetration - 		
2.5									
5	Boring terminated at 5 ft.								
7.5									
10									
12.5									
15									
17.5									



LOG OF BORING No. BC5

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.



Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS			
						Plastic Limit	Liquid Limit		
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85095			Water Content - ●			
						Penetration -			
2.5									
5	Boring terminated at 5 ft.								
7.5									
10									
12.5									
15									
17.5									



LOG OF BORING No. BC6

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85096			Water Content - ●	
2.5						Penetration - 	
5	Boring terminated at 5 ft.						
7.5							
10							
12.5							
15							
17.5							



LOG OF BORING No. BC7

PROJECT: Cadence Phases 2 and 3 **PROJECT NO.:** 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map **ELEVATION:**
DRILLER: D&S Drilling **LOGGED BY:** SD
DRILLING METHOD: 8" Power Auger **DATE:** 7/27/2018
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS			
						Plastic Limit	Liquid Limit		
0	(SC) Silty Clayey Sand, low-medium plasticity, slightly damp, light brown		85097			Water Content - ●			
						Penetration -			
2.5									
5	Boring terminated at 5 ft.								
7.5									
10									
12.5									
15									
17.5									



LOG OF BORING No. BC8

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS			
						Plastic Limit	Liquid Limit		
0	(SC) Clayey Sand, low-medium plasticity, slightly damp, light brown		85098						
2.5									
5	Boring terminated at 5 ft.								
7.5									
10									
12.5									
15									
17.5									



LOG OF BORING No. BC9

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS			
						Plastic Limit	Liquid Limit		
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85099			Water Content - ●			
						Penetration -			
2.5									
5	Boring terminated at 5 ft.								
7.5									
10									
12.5									
15									
17.5									



LOG OF BORING No. BC10

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS			
						Plastic Limit	Liquid Limit		
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85100			Water Content - ●			
						Penetration -			
2.5									
5	Boring terminated at 5 ft.								
7.5									
10									
12.5									
15									
17.5									



LOG OF BORING No. BC11

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS			
						Plastic Limit	Liquid Limit		
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85101			Water Content - ●			
						Penetration -			
2.5									
5	Boring terminated at 5 ft.								
7.5									
10									
12.5									
15									
17.5									



LOG OF BORING No. BC12

PROJECT: Cadence Phases 2 and 3 PROJECT NO.: 8144
CLIENT: PPGN-RAY, LLLP and PPGN-Crismon, LLLP
PROJECT LOCATION: Ellsworth Road and Guadalupe Road
LOCATION: See Site Map ELEVATION: _____
DRILLER: D&S Drilling LOGGED BY: SD
DRILLING METHOD: 8" Power Auger DATE: 7/27/2018
DEPTH TO - WATER> INITIAL: ▽ AFTER 24 HOURS: ▽ CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

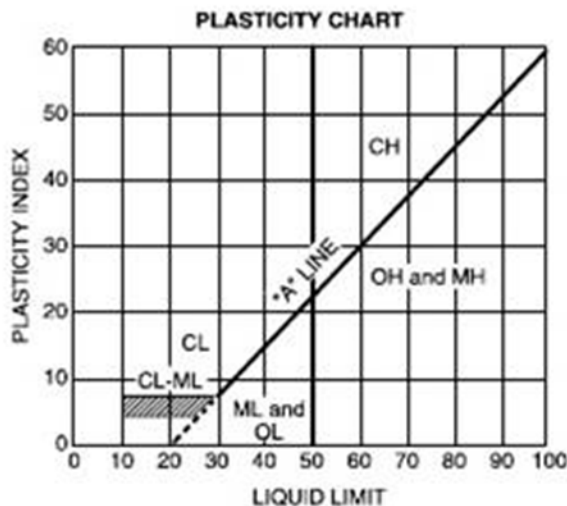
Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS			
						Plastic Limit	Liquid Limit		
0	(CL) Sandy Clay, low-medium plasticity, slightly damp, light brown		85102			Water Content - ●			
						Penetration -			
2.5									
5	Boring terminated at 5 ft.								
7.5									
10									
12.5									
15									
17.5									

Appendix D

Key To Soil Symbols and Classifications

Common Strata Symbols

	High plasticity clay (CH -- C)		Well graded gravel with clay (GW-GC -- 830)
	Inorganic silts and clays (CH-MH -- MC)		Well graded gravel with silt (GW-GM -- 83Z)
	Low plasticity clay (CL -- O)		Well graded gravel/clayey gravel (GW-GP -- 83G)
	Low-high plasticity clays (CL-CH -- CO)		Well graded gravel and sand (GW-SW -- 83D)
	Silty low plasticity clay (CL-ML -- CZ)		Elastic silt (MH -- M)
	Fill (FILL -- F)		Silt (ML -- Z)
	Clayey gravel (GC -- O8)		High plasticity organic clays (OH -- 5)
	Clayey sand and gravel (GC-SC -- DO8)		Low plasticity organic silts (OL -- 4)
	Silty gravel (GM -- Z8)		Basalt (or generic rock) (ROCK -- J)
	Silty clayey gravel (GM-GC -- ZO8)		Clayey sand (SC -- DO)
	Silty sand and gravel (GM-SM -- O8)		Silty sand (SM -- O)
	Poorly graded gravel (GP -- G)		Poorly graded clayey silty sand (SC-SM -- :ZO)
	Poorly graded gravel with clay (GP-GC -- DGO3)		Poorly graded silty fine sand (SM-ML -- :Z)
	Poorly graded gravel with silt (GP-GM -- DGZ3)		Poorly graded sand (SP -- :)
	Poorly graded gravel and sand (GP-SP -- :G)		Poorly graded sand with clay (SP-SC -- :R)
	Well graded gravel (GW -- 83)		Poorly graded sand with silt (SP-SM -- :S)
	Well graded sand (SW -- D)		Well graded sand with gravel (SW -- D9)
	Well graded sand with clay (SW-SC -- DR)		Silty sand with gravel (SM -- O9)
	Well graded sand with silt (SW-SM -- D=)		Clayey sand with gravel (SC -- DO9)



Relative Density of Cohesionless Soils (blows/ft)

Very Loose	0 to 4
Loose	5 to 10
Medium	11 to 30
Dense	31 to 50
Very Dense	over 50

Relative Degree of Plasticity (PI)

Non-Plastic	0
Low	1 to 7
Low-Medium	8 to 14
Medium	15 to 21
Medium-High	22 to 28
High	29 to 35
Very High	Over 35

Relative Proportions (%)

Trace	1 to 10
Little	11 to 20
Some	21 to 35
With	36 to 50

Particle Size Identification (Diameter)

Boulder	8.0" or Larger
Cobbles	3.0" to 8.0"
Coarse Gravel	0.75" to 3.0"
Fine Gravel	5.0 mm to 3.0"
Coarse Sand	2.0 mm to 5.0 mm
Medium Sand	0.4 mm to 2.0 mm
Fine Sand	0.07 mm to 0.4 mm
Silt	0.002 mm to 0.07 mm
Clay	Less Than 0.002